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REMARKS

Claims 1-4 and 7-32 are pending in the application. Claims 12-32 have been withdrawn from consideration as being directed to a non-elected invention.

Applicants have amended claim 1 to recite that radical generating groups are produced on the surface of the treated resins and Applicants have also amended claim 1 to positively recite using iodometry to measure absorbance at 360 nm. Support for this amendment can be found on page 11, lines 11-19 of Applicants' specification.

Statement of Substance of Examiner Interview

On June 3, 2004, Applicants' representative conducted an interview with Examiner Goff to clarify the Examiner's position regarding his response to Applicants' arguments submitted on December 2, 2003. The Examiner maintained the position that the claims do not specifically recite testing by iodometry. The Examiner stated that he would reconsider the rejection in view of additional information and/or amendments submitted by Applicants.

Response

Claims 1, 2, 7(1) and 7(2) have been rejected under 35 U.S.C. § 102(b) as allegedly anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as allegedly obvious over Shimada et al, U.S. Patent No. 5,662,972 ("Shimada").

The Examiner asserts that the claims do no require testing by iodometric measurement. The Examiner asserts that Shimada discloses corona treating a fluorine resin to form a number of different functional groups on the surface including at least acidic functional groups (col. 2, lines

63-67 and col. 3, lines 1-3). Therefore, the Examiner concludes that it appears that the fluorine resin taught by Shimada would have the claimed absorbance at 360 nm.

Applicants argued in the Amendment of December 2, 2003 that radical-generating functional groups are not generated on the surface of the fluorine resin if it is treated by Shimada's method. Thus, the absorbance in Shimada is almost zero at 360 nm when the fluorine resin of Shimada is measured by iodometry.

Additionally, Applicants have studied and conducted testing on radical-generating functional groups (such as a diazo group, a peroxide, etc.) which are produced on the surface of Applicants' fluorine resin which is treated by corona discharge. Applicants use an iodometry measurement as an index for indicating bonding properties with a crosslinking elastic adhesive body upon crosslinkage. As a result of the studies, Applicants have found that a fluorine resin which is treated so that its absorbance at 360 nm is detected as a value of 0.02/100 cm² or over has unexpectedly superior bonding properties. Thus, the treated fluorine resin can be directly laminated with a crosslinking elastic adhesive body such as ethylene-vinyl acetate copolymer, providing a laminate which is integrally combined and has excellent bonding property.

The Examiner alleges that Shimada teaches subjecting the fluorine resin to a corona discharge treatment in an inert gas atmosphere containing an organic compound having a functional group prior to bonding with the polyamide and that the corona discharge treatment produces functional groups on and within the surface of the fluorine resin resulting in a surface having improved adhesive properties (on page 2, item 4 of the Office Action).

In this regard, Applicants submit herewith a Declaration under 37 C.F.R. § 1.132, as evidence that Shimada fails to disclose or suggest Applicants' claimed invention. The

Declaration fully proves the difference between the present invention and the Shimada reference.

When the fluorine resin surface was treated by corona discharge treatment in a nitrogen gas atmosphere containing vinyl acetate vapor as disclosed in Shimada (Comparison 1), only hydrophilic groups were produced on the surface thereof, but radical generating groups were not produced, thus no absorbance was observed at 360 nm by iodometry, resulting in the laminate having poor bonding force.

On the other hand, Applicants' inventive surface treating method produces radical generating groups on the surface thereof, thus the treated resin shows unexpectedly superior bonding force (Examples 1 and 2) compared to that obtained by Shimada's method (Comparison 1).

Accordingly, Shimada's method which requires the compound having functional groups in the inert atmosphere to conduct discharge treatment is fundamentally different from the present invention, and the present invention and the results produced therefrom are unexpected in view of Shimada.

Therefore, Applicants' surface treating method is not anticipated by or obvious over Shimada. Accordingly, withdrawal of the rejection is respectfully requested.

Claims 1, 2, 7(1), 7(2), 8 and 11 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the "admitted" prior art (specification pages 1 and 2).

The Examiner asserts that he has not suggested that the "admitted" prior art (alone) anticipates these limitations (page 10 of the Office Action).

As indicated above, the Examiner has, in fact, rejected claims 1, 2, 7(1), 7(2), 8, and 11 as being unpatentable over the "admitted" prior art alone (page 3, item 5 of the Office Action). In

view of the Examiner's statement and further in view of Applicants' arguments submitted in the Amendment dated December 2, 2003, Applicants respectfully request that the Examiner withdraw the § 103 rejection over the "admitted" prior art.

Claims 3, 4, 7(3) and 7(4) have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Shimada et al. ("Shimada") in view of Kreil et al, U.S. Patent No. 4,594,262 ("Kreil").

Claims 3, 4, 7(3), 7(4), 8 and 11 have also been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the "admitted" prior art in view of Shimada et al. ("Shimada") and Kreil et al ("Kreil").

Claim 9 has been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the "admitted" prior art and further in view of Krause et al., U.S. Patent No. 5,958,532 ("Krause"). Claim 9 has also been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the "admitted" prior art, Shimada et al. ("Shimada") and Kreil et al. ("Kreil"), and further in view of Krause et al. ("Krause").

Claim 10 has been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the "admitted" prior art and further in view of Kataoka et al., U.S. Patent. No. 6,307,145, ("Kataoka"). Claim 10 has also been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the "admitted" prior art, Shimada et al. ("Shimada") and Kreil et al. ("Kreil"), and further in view of Kataoka et al. ("Kataoka").

The Examiner asserts that Kreil is used to exemplify that the amount of oxygen in the "inert gas atmosphere" is known to be 100 ppm or less and Kreil is not cited to show any other features of the current invention (page 12 of the Office Action).

Applicants' comments regarding Shimada and the "admitted" prior art above are incorporated herein. For the above stated reasons, Applicants submit that Shimada and the "admitted" prior art do not disclose or suggest Applicants' surface treating method.

Additionally, as previously stated in the Amendment dated December 2, 2003, Applicants submit that with respect to the rejection to claim 3, the bonding property between the fluorine resin and the crosslinking elastic adhesive body as well as storage stability are unexpectedly improved by the inventive surface treating method which comprises subjecting the surface of a fluorine resin to corona discharge treatment in a nitrogen gas atmosphere while controlling a concentration of an oxygen gas within the range of 4 to 150 ppm.

Even if Kreil is applied as an exemplary showing of what the art considers a conventional oxygen concentration in an inert atmosphere, the existence of the compounds having functional groups are indispensable in the inert gas atmosphere in Shimada's method as discussed above, therefore, one of skill in the art would expect from the combination of Shimada and Kreil that the inert gas atmosphere for corona discharge treatment would require compounds having functional groups as well as containing oxygen as taught by Kreil. On the contrary, in the present invention, the inert gas atmosphere does not require such compounds.

Shimada only suggests that improved adhesion between the fluorine containing resin and the coating resin can be obtained. In contrast, when the oxygen concentration is controlled in Applicants' claimed range in the inert gas atmosphere, the present invention achieves both unexpectedly superior bonding property and storage stability as shown in Examples 3 to 7 and Comparative Examples 2 to 4 in Table 2 on page 28 of Applicants' specification.

U.S. Appln. No.: 09/698,219
Amendment under 37 C.F.R. § 1.116

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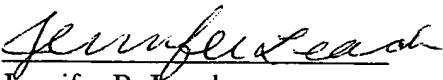
Even the combination of the cited references including the admitted prior art would not teach or suggest the method which results in unexpectedly superior bonding properties as well as unexpectedly superior storage stability.

Accordingly, the present invention is not obvious over the cited references and Applicants respectfully request withdrawal of the foregoing rejections.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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Respectfully submitted,


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IN THE U.S. PATENT AND TRADEMARK OFFICE

APPLICANT: Taichi KOBAYASHI et al.

SERIAL NO.: 09/698,219

FILED: October 30, 2000

FOR: Method for the Surface Treatment of a
Fluorine Resin, Method for Making a
Laminate, and a Laminate

GROUP: 1733

EXAMINER: GOFF II, JOHN L

DECLARATION

Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir,

I, Masato YOSHIKAWA, resident of 3-16-15-102,
Josuihoncho, Kodaira-shi, Tokyo, Japan do hereby declare
that:

1. I was graduated from Tokyo University of
Agriculture and Technology, Faculty of Technology
Textiles and Polymer Science Course, Japan in March,

1980 and then completed Master Course, Textiles and Polymer Science Division, of the same University in March, 1982. Since April 1982, I have been employed by Bridgestone Corporation, the assignee of the above-identified application. I have been engaged in research and development relating to the research for physical properties of high molecular compound, particularly for adhesiveness of fibers to rubber in the laboratory of the Company.

2. I am one of the named inventors of the above-identified application and hence, am familiar with the subject matter disclosed in said application.

3. In order to show the feature of the present invention, I conducted the following experiments.

[Experiment]

Comparison 1

The following ethylene-tetrafluoroethylene copolymer film (with a thickness of 100 μm) was provided as a fluorine resin film and subjected to corona discharge treatment in a nitrogen gas atmosphere containing 7 mol% of vinyl acetate vapor under a charge density of 3 W/cm² (30 kW/m²) for two seconds to obtain a film

surface-modified with vinyl acetate, followed by measurement of an energy density and absorbance determined by iodometry.

Fluorine resin film

Neoflon ETFE EF-0100, made by Daikin Ind. Co., Ltd.

Absorbance

A solution for absorbance analysis was prepared in the following manner. Sodium iodide was added to a mixed solution of 40 ml of benzene, 60 ml of 2-propanol and 1 ppm of iron chloride to saturation.

The treated fluorine resin film was immersed at one side thereof with an area of 100 cm² in 10 ml of the mixed solution, kept for 10 minutes at 60°C, followed by quick addition of 1 ml of water to stop the reaction. During the course of the immersion, I⁻ was oxidized into I³⁻ by means of radical generating functional groups if they are produced.

The solution that was obtained through the above procedure was transferred to a quartz glass cell with a light path length of 10 mm, and an absorbance at 360 nm, which was an absorption wavelength of I³⁻, was measured

by use of a spectrophotometer Model U-4000, made by Hitachi Ltd.

Bonding force

Next, the thus treated fluorine resin film was laminated with a film (500 μm) of an ethylene-vinyl acetate copolymer composition having the following formulation. A 100 μm thick polyester film was laminated on a side of the ethylene-vinyl acetate copolymer composition film opposite to the side laminated with the fluorine resin, followed by hot pressing at 150°C for 15 minutes at 1,000 kPa to cure the film and integrally combine them together.

Ethylene-vinyl acetate copolymer composition

Ultracene 634*:	100 parts by weight
Triallyl isocyanurate:	2
γ -Methacryloxypropyltrimethoxysilane:	0.5
1,1-Bis(t-butyl peroxy)-3,3,5-trimethylcyclohexane:	2

*Ultracene 634: ethylene-vinyl acetate resin having a vinyl acetate content of 26 wt%, made by Toso Corp.

The thus obtained laminate was checked with respect to bonding force by means of Autograph (AGS-100D), made by Shimadzu Corporation.

The results are shown in Table I. The results of Examples 1 and 2 and Comparative Example 1 of the specification were also shown in Table I.

Table I

	Energy density (kJ/m ²)	Amount of radical-generating functional groups (Absorbance/100 cm ²)	Bonding force (N/25 mm)
Comparative Example 1	0	0	0
Example 1	27	0.033	50
Example 2	50	0.047	53
Comparison 1	60	0	6

As described above, it is revealed that the method of Shimada (Comparison 1) does not produce the radical-generating functional groups on the surface of ETFE resin. In Comparison 1, bonding force was higher than that of the untreated fluorine resin (Comparative Example 1) owing to hydrophilic groups produced on the surface thereof. However, Comparison 1 achieved much far lower bonding force compared to Examples 1 and 2 of the invention.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Dated this 23rd day of July , 2004

Masato Yoshikawa

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